

HDL Verifier™ Support Package for Microchip FPGA Boards

User's Guide



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HDL Verifier Support for Microchip FPGA Boards

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Microchip FPGA Board Support from HDL Verifier

HDL Verifier automates the verification of HDL code on FPGA boards by providing connections between your FPGA board and your simulations in Simulink® or MATLAB®.

FPGA-in-the-loop (FIL) enables you to run a Simulink or MATLAB simulation that is synchronized with an HDL design running on an FPGA board.

To use FPGA-in-the-loop, you must have a supported FPGA board connected to your MATLAB host computer using a supported connection type, and a supported synthesis tool.

Note The HDL Verifier Support Package for Microchip FPGA Boards does not support board customization.

Supported Microchip FPGA Boards

This support package enables FPGA-in-the-loop simulation for the boards in the table.

Device Family	Board	Ethernet	JTAG	PCI Express	Comments
Microchip SmartFusion® 2	Microchip SmartFusion 2 SoC FPGA Advanced Development Kit	X			See “Installing Microchip SmartFusion 2 SoC FPGA Advanced Development Kit” on page 1-3

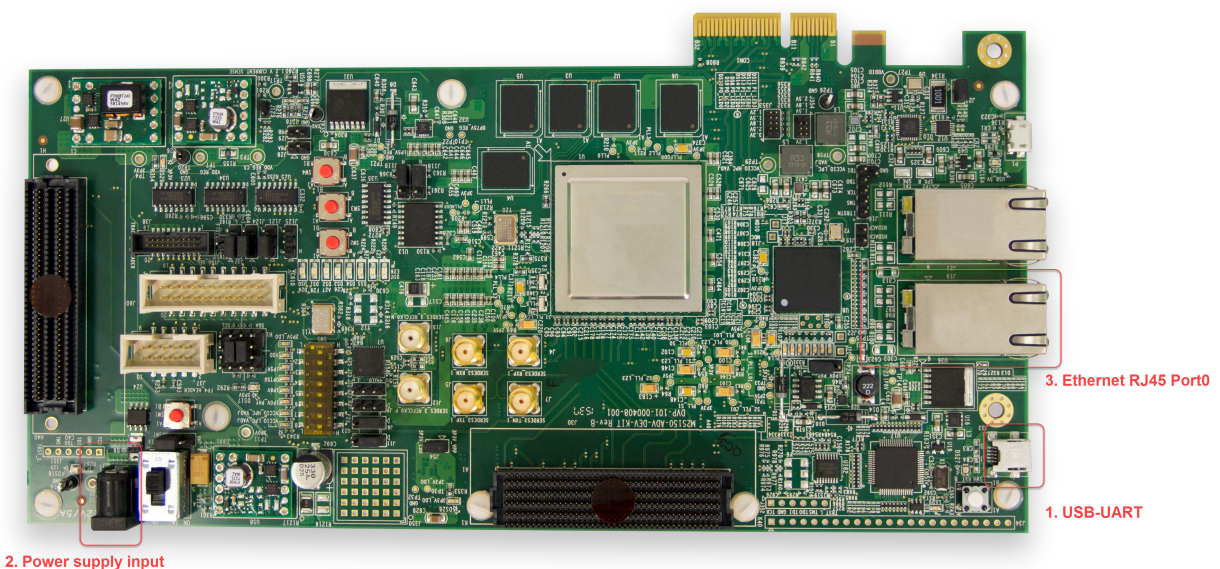
Device Family	Board	Ethernet	JTAG	PCI Express	Comments
Microchip Polarfire®	Microchip Polarfire Evaluation Kit	X			See “Installing Microchip Polarfire Evaluation Kit” on page 1-4. Use with Libero® SoC v12.0.
Microchip RTG4®	RTG4-DEV-KIT	X			

Installing Microchip SmartFusion 2 SoC FPGA Advanced Development Kit

The Microchip SmartFusion 2 SoC FPGA Advanced Development Kit requires a special setup. Follow the following steps to ensure proper connection:

1 Board setup

To ensure functionality, connect the board and set it up as follows:



- 1 Connect the USB cable to the USB-UART terminal on the board.
- 2 Connect the power cable to the power supply input (12V DC).
- 3 Plug the RJ45 cable into RJ45-Port0.

2 Program the FPGA

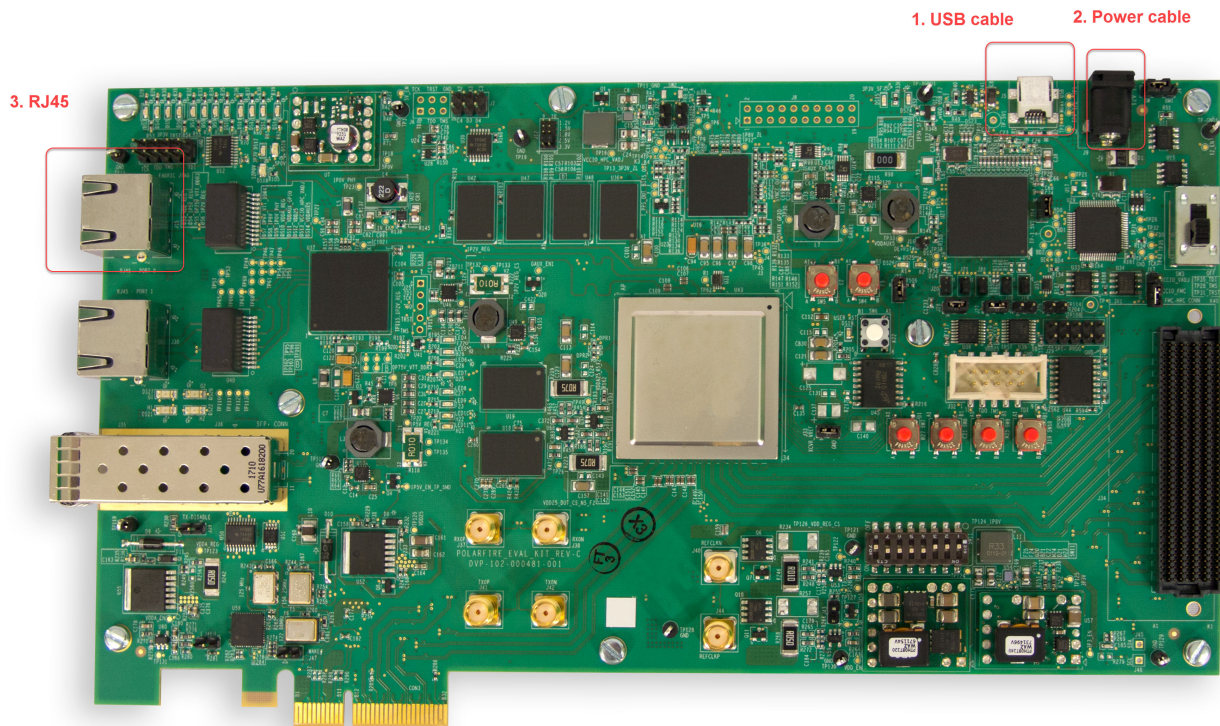
Follow the steps using the **FPGA-in-the-Loop Wizard** to program the FPGA.

Installing Microchip Polarfire Evaluation Kit

The Microchip Polarfire Evaluation Kit requires a special setup. Follow the following steps to ensure proper connection:

1 Board setup

To ensure functionality, connect the board and set it up as follows:



- 1 Connect the USB cable to the J5 connector on the board.
- 2 Connect the power cable to the J9 jack on the board (12V DC , 5A).
- 3 Plug the RJ45 cable into RJ45-Port0 (J15 connector).
- 4 Set the jumpers on the board as follows:
 - J28 - closed
 - J27 - closed

J227 - closed

J26 - closed

J20 - 2-3 closed

J21 - 2-3 closed

J22 - 2-3 closed

J18 - 2-3 closed

J19- 2-3 closed

J23 - open

2 Program the FPGA

Follow the steps using the **FPGA-in-the-Loop Wizard** to program the FPGA.

3 Power Cycle

Once the FPGA programming file is loaded, turn off the FPGA power, and then back on before simulating.

Supported EDA Tools and Hardware

Software

Microchip Libero SoC

Use this support package with these recommended versions:

- Microchip Libero SoC v12.6 (supports SmartFusion 2 and RTG4 boards)
- Microchip Libero SoC v12.0 (supports Polarfire boards)

These features require a gold or platinum license from Microchip. For tool setup instructions, see “Software Setup” on page 1-6.

Software Setup

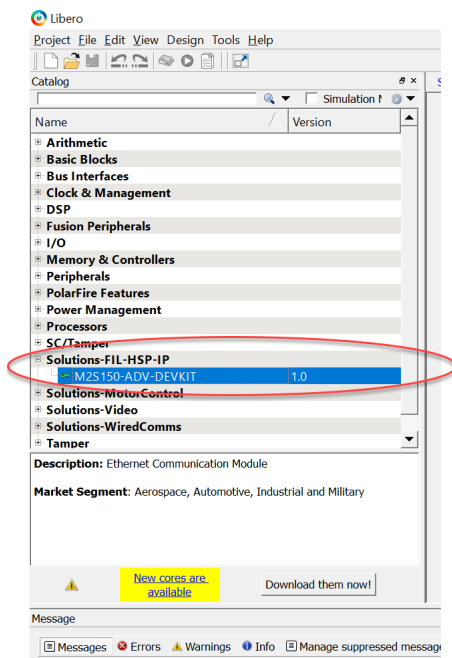
To use the Libero tool suite with HDL Verifier FPGA-in-the-loop (FIL), you must first add the FIL IP to Libero SoC Mega Vault.

Software Setup with an Internet Connection

To add the FIL IP to Libero SoC using an internet connection, follow these steps:

- 1 Launch Libero SoC.
- 2 From the Libero SoC menu, select **View > Windows > Catalog** to open the Catalog pane.
- 3 Click the **Download them now!** button to start downloading.

The IP catalog list now includes **Solution-FIL-HSP-IP**.



- 4 Close Libero SoC.

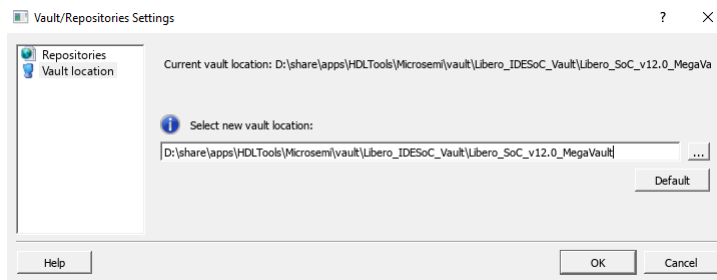
- 5 Launch MATLAB.
- 6 Set `hdlsetuptoolpath` to point to the Libero SoC installation. For example:

```
hdlsetuptoolpath('ToolName','Microchip Libero SoC',...
  'ToolPath','C:\Microsemi\Libero_SoC_v12.0\Designer\bin\libero.exe')
```

Software Setup Without Internet Connection

To add the FIL IP to Libero SoC with no internet connection, follow these steps:

- 1 On a machine with internet connection, navigate to the Libero SoC Downloads page.
- 2 Download the desired version of Mega Vault, and copy it to a portable storage device (such as a USB drive).
- 3 Connect the storage device to the target machine, copy the Mega Vault file to the local machine, then unzip this file.
- 4 Launch Libero SoC.
- 5 From the Libero SoC menu, select **Project > Vault/Repositories Settings > Vault location**. Set the path to the Mega Vault location.



- 6 Close Libero SoC.
- 7 Launch MATLAB.
- 8 Set `hdlsetuptoolpath` to point to the Libero SoC installation. For example:

```
hdlsetuptoolpath('ToolName','Microchip Libero SoC',...
  'ToolPath','C:\Microsemi\Libero_SoC_v12.0\Designer\bin\libero.exe')
```

Note When setting up for RTG4 without an internet connection, you must install Mega Vault v12.3 if using Libero v12.0 or newer.

Required IP Cores for FPGA-in-the-Loop

Installing Microchip Mega-Vault, enables access to the required IP cores for FIL simulation. You can choose to download only the required IP cores.

- Microchip SmartFusion 2 requires `Microsemi:SolutionCore:idu_top`
- Microchip Polarfire requires:
 - `Actel:SgCore:PF_CCC`
 - `Microsemi:SolutionCore:iog_cdr_test_wrapper`
- RTG4 requires:

- Actel:SgCore:RTG4FCCC
- Microsemi:SolutionCore:CM1_TOP

Board Connections

Ethernet Connection

You can run FPGA-in-the-loop over an Ethernet connection.

Required Hardware	Supported Interfaces	Required Software
<ul style="list-style-type: none">• Gigabit Ethernet card• Cross-over Ethernet cable• FPGA board with supported Ethernet connection	<ul style="list-style-type: none">• Gigabit Ethernet — SGMII	There are no software requirements for an Ethernet connection, but ensure that the firewall on the host computer does not prevent UDP communication.

See Also

More About

- “FPGA-in-the-Loop Simulation”
- “FPGA-in-the-Loop Simulation Workflows”

Download HDL Verifier FPGA Board Support Packages

In this section...

“HDL Verifier Support Package for Microchip FPGA Boards” on page 1-9

“Install with Connection to Internet” on page 1-9

“Install Support Package Offline” on page 1-10

HDL Verifier Support Package for Microchip FPGA Boards

The support package for Microchip FPGA boards contains the board definition files for FPGA-in-the-loop (FIL) simulation with HDL Verifier and supported Microchip hardware. To perform FIL simulation with Microchip FPGA boards, first download the Microchip FPGA board support package.

To install support packages:

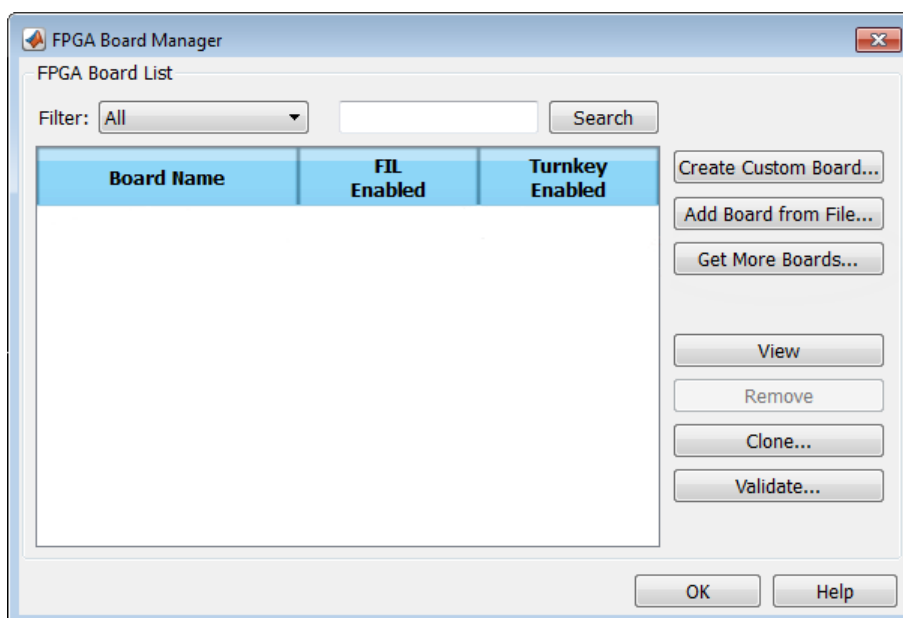
- On the MATLAB **Home** tab, in the **Environment** section, click **Add-Ons > Get Hardware Support Packages**.

You can also download FPGA board support packages from within the FPGA-in-the-Loop Wizard or the FPGA Board Manager.

Install with Connection to Internet

From the FPGA Board Manager

- 1 In the MATLAB command window, enter the following command:
`fpgaBoardManager`
- 2 In the FPGA Board Manager dialog box, click **Get More Boards**.

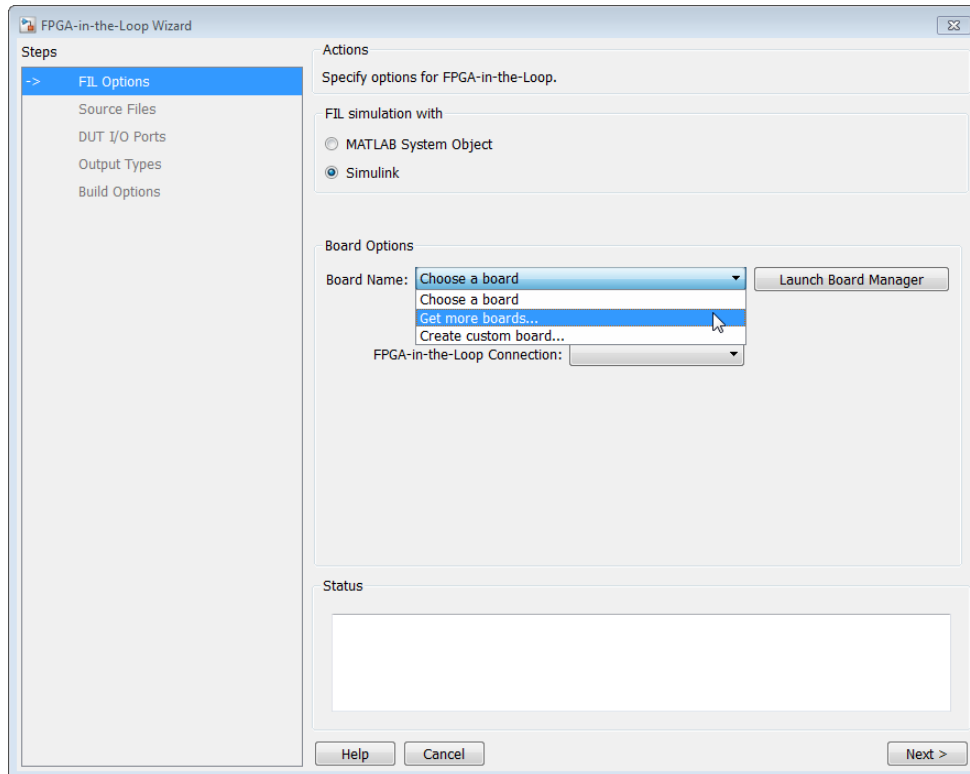


From the FIL Wizard

- 1 In the MATLAB command window, enter the following command:

```
filWizard
```

- 2 In the **FIL Options** pane, at **Board Name**, select **Get more boards** from the drop-down menu.



Install Support Package Offline

To install the support packages without an internet connection, first download the packages on a computer that *does* have an internet connection.

- 1 On the computer with the internet connection, start MATLAB.
- 2 On the MATLAB **Home** tab, in the **Environment** section, click **Add-Ons > Get Hardware Support Packages**.
- 3 Select your desired support package, and use the **Install** button pull-down menu to select **Download Only...**
- 4 Accept the license and select a folder for the download.
- 5 Copy the entire downloaded folder, for example, the R2022b folder, to a shared network drive or removable media, such as a USB drive.

Then, on the computer where you want to install the support packages:

- 1 Copy the downloaded folder to the host computer.
- 2 To start the installer, run the `install_supportsoftware.exe` executable file.

- 3 Follow the installer prompts to install the support package. If you do actually have an internet connection, you are prompted to log in to your MathWorks® account.

See Also

Related Examples

- “Block Generation with the FIL Wizard”
- “System Object Generation with the FIL Wizard”

